

IN THE CLAIMS:

1. (Currently Amended) A method of imaging an object for dental purposes, comprising the steps of:

(a) projecting a striped pattern on to the object to be imaged along an angle of projection,

(b) recording the projected striped pattern as a basic image (R_i) with a picture receiver at an angle other than the angle of projection,

(c) repeating steps (a) and (b) being carried out at a number of different positions of the phase relation of the striped pattern to provide a plurality of basic images, and

(d) computing an image of said object from the plurality of basic camera-images that are out-of-phase with each other (R_1, \dots, R_n), wherein in order to suppress periodic disturbances ~~in step c),~~

(d1) recording ($n+2$) basic images (R_1, R_2, \dots, R_{n+2}) of which successive basic images show a phase shift,

(d2) forming ~~three~~ first, second and third groups of basic images (R_1, R_2, \dots, R_n ; R_2, R_3, \dots, R_{n+1} ; R_3, R_4, \dots, R_{n+2}),

(d3) computing a first phase related image (P_1) from the first group of basic images (R_1, R_2, \dots, R_n), a second phase related

image (P_2) from the second group of basic images (R_2, R_3, \dots, R_{n+1}),
and computing a third phase related image (P_3) from the third group
of basic images (R_3, R_4, \dots, R_{n+2}),

$\epsilon 4(d4)$ averaging the first phase related image (P_1) and the
third phase related image (P_3) in order to obtain an intermediate
image (P_z), and averaging the second phase related image (P_2) and
the intermediate image (P_z) in order to obtain a phase related image
(P) having a reduced amount of noise, n being an integer at least
equal to 3, and

$\epsilon 5(d5)$ computing an image of the object to be imaged from
the phase related image (P) having a reduced amount of noise.

2. (Currently Amended) TheA method as defined in claim 1,
wherein the computed phase related images (P_1, P_2) are averaged with
weighting factors.

3. (Currently Amended) TheA method as defined in claim 1,
wherein the basic images ($R_1 \dots, R_m$) are each recorded with a constant
shift of the phase relation of the lattice (19).

4.-5. (Canceled)

6. (Currently Amended) TheA method as defined in claim 1,
wherein n is 4.

7. (Currently Amended) TheA method as defined in claim 1, wherein the basic images (R_1, \dots, R_m) are recorded by an interlacing method so that the two fields are out-of-phase with each other.
8. (Currently Amended) TheA method as defined in claim 7, wherein the two fields show a phase shift relative to each other which is equal to half the phase shift between successive basic images (R_1, \dots, R_m).
9. (Currently Amended) TheA method as defined in claim 7, wherein a phase related image (P_1, P_2) is computed from each of the fields of a basic image (R_1, \dots, R_m) and the two phase related images (P_1, P_2) are averaged prior to further processing in such a manner that a phase related image (P) having a reduced amount of high-frequency noise is formed.
10. (Currently Amended) TheA method as defined in claim 1, wherein prior to step a), an image of a specific test object is recorded and that on the basis of an analysis of the image of the test object a suitable scheme for use in the computation of the noise-reduced phase related image for the object to be imaged is selected.
11. (Currently Amended) TheA method as defined in claim 1, wherein the object to be imaged and a camera used for recording the projected striped pattern can be freely positioned relative to each other.

12. (Currently Amended) TheA method as defined in claim 1, wherein an image of one or more teeth in a oral cavity of a patient is recorded by manual surveying over a short measurement period.

13. (Currently Amended) TheA method as defined in claim 1, wherein the image to be created of said object is one of a relief image and a contrast image.

14. (Currently Amended) ~~A device for carrying out the process as defined in claim 1~~imaging an object for dental purposes, comprising

projecting means for projecting a striped pattern on to the object to be imaged,

a camera for recording the projected striped pattern in the form of a basic image (R_1, \dots, R_m)

means for computing an image of the object to be imaged from a number of basic camera images (R_1, \dots, R_m) that are out-of-phase with each other with formation of three groups of basic images ($R_1, R_2, \dots, R_n; R_2, R_3, \dots, R_{n+1}$),

means for averaging two groups of basic images, and

means for averaging the averaged image with a third group of images.

15. (Currently Amended) A method of imaging an object for dental purposes, comprising the steps of:

(a) projecting a striped pattern on to the object to be imaged,

(b) recording the projected striped pattern as a basic image (R_i) with a picture receiver at an angle other than the angle of projection,

(b1) wherein the basic images (R_1, \dots, R_m) are recorded by an interlacing method so that the two fields are out-of-phase with each other,

(c) repeating steps (a) and (b) being carried out at a number of different positions of the phase relation of the striped pattern, and

(d) computing an image of said object from the plurality of basic camera images that are out-of-phase with each other (R_1, \dots, R_n),

wherein in order to suppress periodic disturbances, i.e., noise, in step (d),

(d0) wherein a phase related image (P_1, P_2) is computed from each of the fields of a basic image (R_1, \dots, R_m) and the two phase related images (P_1, P_2) are averaged prior to further processing in such a

manner that a phase related image (P) having a reduced amount of high-frequency noise is formed,

$\epsilon 1(d1)$ forming from the basic camera (R_1, \dots, R_m) images at least two groups of basic images (R_1, R_2, \dots, R_n ; R_2 , and R_3, \dots, R_{n+1}),

$\epsilon 2(d2)$ computing a phase related image (P_j) of the object to be imaged from each group of basic images (R_1, R_2, \dots, R_n ; R_2, R_3, \dots, R_{n+1})

$\epsilon 3(d3)$ averaging the computed phase related images (P_1, P_2) such that a phase related image (P) having a reduced amount of noise is formed, and

$\epsilon 4(d4)$ computing an image of the object to be imaged from the phase related image (P) obtained in step (d3) having a reduced amount of noise.

16. (Currently Amended) TheA method as defined in claim 15, wherein the computed phase related images (P_1, P_2) are averaged with weighting factors.

17. (Currently Amended) TheA method as defined in claim 15, wherein the basic images (R_1, \dots, R_m) are each recorded with a constant shift of the phase relation of the lattice (19).

18. (Currently Amended) TheA method as defined in claim 15,

including

recording (n+1) basic images (R_1, R_2, \dots, R_{n+1}) successive basic images showing a phase shift,

forming two groups of basic images (R_1, R_2, \dots, R_n ; R_2, R_3, \dots, R_{n+1}),

computing a first phase related image (P_1) from the first group of basic images (R_1, R_2, \dots, R_n) and computing a second phase related image (P_2) is computed from the second group of basic images (R_2, R_3, \dots, R_{n+1}), and

averaging the first phase related image (P_1) and the second phase related image (P_2) in order to obtain a phase related image (P) having a reduced amount of noise, n being an integer at least equal to 3.

19. (Currently Amended) TheA method as defined in claim 15,

including

recording (n+2) basic images (R_1, R_2, \dots, R_{n+2}) of which successive basic images show a phase shift,

forming three groups of basic images (R_1, R_2, \dots, R_n ; R_2, R_3, \dots, R_{n+1} ; R_3, R_4, \dots, R_{n+2}),

computing a first phase related image (P_1) from the first group of basic images (R_1, R_2, \dots, R_n), computing a second phase related image (P_2) from the second group of basic images (R_2, R_3, \dots, R_{n+1}), and computing a third phase related image (P_3) from the third group of basic images (R_3, R_4, \dots, R_{n+2}), and

averaging the first phase related image (P_1) and the third phase related image (P_3) in order to obtain an intermediate image (P_z), and averaging the second phase related image (P_2) and the intermediate image (P_z) in order to obtain a phase related image (P) having a reduced amount of noise, n being an integer at least equal to 3.

20. (Currently Amended) TheA method as defined in claim 19, wherein n is 4.

21. (Currently Amended) TheA method as defined in claim 15, wherein the two fields show a phase shift relative to each other which is equal to half the phase shift between successive basic images (R_1, \dots, R_m).

22. (Currently Amended) TheA method as defined in claim 15, wherein prior to step (a), recording an image of a specific test object and on the basis of an analysis of the image of the test object selecting a suitable scheme for use in the computation of the noise-reduced phase related image for the object to be imaged.

23. (Currently Amended) TheA method as defined in claim 15, wherein the object to be imaged and a camera used for recording the projected striped pattern can be freely positioned relative to each other.

24. (Currently Amended) TheA method as defined in claim 15, wherein an image of one or more teeth in a oral cavity of a patient is recorded by manual surveying over a short measurement period.

25. (Currently Amended) TheA method as defined in claim 15, wherein the image to be created of said object is one of a relief image and a contrast image.

26. (Currently Amended) ~~A device for carrying out the process as defined in claim 1~~ for imaging an object for dental purposes, comprising

projecting means for projecting a striped pattern on to the object to be imaged,

a camera for recording the projected striped pattern in the form of a basic image (R_1, \dots, R_m),

means for computing an image of the object to be imaged from a number of basic camera images (R_1, \dots, R_m) that are out-of-phase with each other with formation of at least two groups of basic images ($R_1, R_2, \dots, R_n; R_2, R_3, \dots, R_{n+1}$), and

means for recording the basic image by an
interlockinginterlacing method.

27. (Currently Amended) A method of imaging an object for dental purposes, comprising the steps of:

(a) projecting a striped pattern on to the object to be imaged,
(b) recording the projected striped pattern as a basic image (R_i) with a picture receiver at an angle other than the angle of projection,

steps (a) and (b) being carried out at a number of different positions of the phase relation of the striped pattern, and

(c) computing an image of said object from the plurality of basic camera images that are out-of-phase with each other (R_1, \dots, R_n), wherein in order to suppress periodic noise disturbances in step c),

(c1) forming from the basic camera (R_1, \dots, R_m) images at least two groups of basic images (R_1, R_2, \dots, R_n ; R_2 , and R_3, \dots, R_{n+1}),

(c2) computing a contrast image (P_j) of the object to be imaged from each group of basic images (R_1, R_2, \dots, R_n ; R_2, R_3, \dots, R_{n+1})

(c3) averaging the computed contrast images (P_1, P_2) such that a contrast image (P) having a reduced amount of noise is formed, and

(c4) computing an image of the object to be imaged from the

contrast image (P) having a reduced amount of noise.

28. (Currently Amended) TheA method as defined in claim 27, wherein the computed contrast images (P_1 , P_2) are averaged with weighting factors.

29. (Currently Amended) TheA method as defined in claim 27, wherein the basic images (R_1, \dots, R_m) are each recorded with a constant shift of the phase relation of the lattice (19).

30. (Currently Amended) TheA method as defined in claim 27, wherein

recording ($n+1$) basic images (R_1, R_2, \dots, R_{n+1}) successive basic images showing a phase shift,

forming two groups of basic images (R_1, R_2, \dots, R_n ; R_2, R_3, \dots, R_{n+1}),

computing a first contrast image (P_1) from the first group of basic images (R_1, R_2, \dots, R_n) and computing a second contrast image (P_2) from the second group of basic images (R_2, R_3, \dots, R_{n+1}), and

averaging the first contrast image (P_1) and the second contrast image (P_2) in order to obtain a contrast image (P) having a reduced amount of noise, n being an integer at least equal to 3.

31. (Currently Amended) TheA method as defined in claim 27,

including

recording $(n+2)$ basic images $(R_1, R_2, \dots, R_{n+2})$ of which successive basic images show a phase shift,

forming three groups of basic images $(R_1, R_2, \dots, R_n; R_2, R_3, \dots, R_{n+1}; R_3, R_4, \dots, R_{n+2})$,

computing a first contrast image (P_1) from the first group of basic images (R_1, R_2, \dots, R_n) , computing a second contrast image (P_2) from the second group of basic images $(R_2, R_3, \dots, R_{n+1})$, and computing a third contrast image (P_3) from the third group of basic images $(R_3, R_4, \dots, R_{n+2})$, and

averaging the first contrast image (P_1) and the third contrast image (P_3) in order to obtain an intermediate image (P_z) , and averaging the second contrast image (P_2) and the intermediate image (P_z) in order to obtain a contrast image (P) having a reduced amount of noise, n being an integer at least equal to 3.

32. (Currently Amended) TheA method as defined in claim 31, wherein n is 4.

33. (Currently Amended) TheA method as defined in claim 27, including recording the basic images (R_1, \dots, R_m) by an interlacing method so that the two fields are out-of-phase with each other.

34. (Currently Amended) TheA method as defined in claim 33, wherein the two fields show a phase shift relative to each other which is equal to half the phase shift between successive basic images (R_1, \dots, R_m).

35. (Currently Amended) TheA method as defined in claim 33, wherein a contrast image (P_1, P_2) is computed from each of the fields of a basic image (R_1, \dots, R_m) and the two contrast images (P_1, P_2) are averaged prior to further processing in such a manner that a contrast image (P) having a reduced amount of high-frequency noise is formed.

36. (Currently Amended) TheA method as defined in claim 27, wherein prior to step a), recording an image of a specific test object and on the basis of an analysis of the image of the test object selecting a suitable scheme for use in the computation of the noise-reduced contrast image for the object to be imaged.

37. (Currently Amended) TheA method as defined in claim 27, wherein the object to be imaged and a camera used for recording the projected striped pattern can be freely positioned relative to each other.

38. (Currently Amended) TheA method as defined in claim 27, wherein an image of one or more teeth in a oral cavity of a patient is recorded by manual surveying over a short measurement period.

39. (Currently Amended) A device for ~~carrying out the process as defined in claim 27~~imaging an object for dental purposes, comprising

projecting means for projecting a striped pattern on to the object to be imaged,

a camera for recording the projected striped pattern in the form of a basic image (R_1, \dots, R_m),

means for computing an image of the object to be imaged from a number of basic camera images (R_1, \dots, R_m) that are out-of-phase with each other with formation of at least two groups of basic images ($R_1, R_2, \dots, R_n; R_2, R_3, \dots, R_{n+1}$), and

means for computing a contrast image from the at least two groups of basic images.